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The Forests on the National Domain.

THE forest-covered public domain of the United States is now, with some exceptions in the Gulf States, confined to those portions of the country west of the 100th meridian. These forests, where they come within the direct and immediate influence of the Pacific Ocean, are unsurpassed in the quantity and value of the material which they contain; in all other parts of Western America insufficient moisture has made them thin and stunted. Such as they are, however, the forests of the interior regions of the continent play an important and controlling part in the development of all that vast region, and influence the welfare of communities which now perhaps never give a thought to their existence. For, although often scattered, thin and stunted, they regulate the great rivers of the continent and so have an important bearing on the material welfare of a very considerable part of the American people. China within the last year has shown us only too plainly what a great river, deprived of the protecting influence of the forest at its source, can accomplish in death and desolation; and what has happened in China, will some day happen in America, if the forests which now guard the mountain slopes above the head-waters of the Columbia and the Missouri are sacrificed through the greed or the indifference of our people.

A large population is directly dependent, too, upon these western forests, for the water they store for irrigation, without which no agriculture is possible in nearly all that region, and for the lumber and fire-wood they yield.

They are forests, too, such is the want of moisture in all the interior of the continent, which have a hard struggle for existence; the resinous character of the trees and the dryness of the soil make fires exceptionally dangerous and destructive; and these conditions render the restoration of a forest once destroyed practically an impossibility. We mention these familiar facts to show the necessity of applying to these forests the most careful methods of protection and administration which can be devised, both because they are in themselves of very great value, and because peculiar climatic and topographical conditions make it a much more difficult matter to protect and extend them than those in more favored parts of the country. They can never be secure in private hands; they may be preserved and even extended if the general government can be made to realize, what all other civilized nations now realize, that forests are essential to the public welfare, and that they can be safely managed for the good of all only by government administration. Individuals are not, and never can be, safe guardians of a forest upon which a community depends; and perhaps the most important question which at this time waits the action of Congress is such a settlement of the future of the public forests as will prevent individuals from securing title to any portion of them, or from unlawfully entering or devastating them. Other public questions can wait a few weeks or a few months without any very serious or at least fatal results, but when a forest of Fir or of Redwood on the Pacific Coast is swept away, there is destroyed what it will require five centuries to restore; and twice that time will not be enough to cover with trees again the slopes of Colorado or Nevada mountains devastated by fire. And yet while Congress year after year refuses to consider seriously the question of forest protection on the public domain, thousands of acres of these forests are destroyed every year by fires which might have been prevented, or by trespassers who might have been caught and punished.

Two bills relating to the public forests now await the action of Congress. House bill No. 7901 has already been favorably reported upon by the Committee on Public Lands. The provisions of this bill contain many dangerous elements, and cannot effect the protection of the forests. It provides that the fee of certain lands shall remain vested in the Government, but that the timber may be sold from these lands without restriction, and it provides no administrative machinery for the protection of the forests from fire, always their greatest danger. The use of the military, except perhaps at the very outset, and before proper officers can be trained as forest guardians for such regions as it may be deemed expedient to retain in forest, is hardly a practicable measure, or one which is likely to result in any practical good. The public interest demands that this bill should be defeated.

House bill No. 6045 was prepared under the auspices of the American Forestry Congress, and has the endorsement of many persons most actively and intelligently interested in preserving the forests of this country. It provides that permanent forest preserves shall be established under a forest officer and proper subordinates. They are to embrace lands better suited for forest growth than for any other purpose, especially lands situated at the head-waters of important streams; and they are to be kept in permanent forest and to be carefully guarded from spoliation and destruction. Timber, however, may be sold when it is clearly advantageous to do so, but only under the direction of a government officer, and with a proper regard to the future development of the forest. Unauthorized cutting, and other injury to the preserved forests are to be made criminally punishable. Forest guardians, and methods for their appointment, are provided for, and the not excessive appropriation of half a million dollars to carry out the provisions of the bill is asked for. This bill has much to commend it, and it would be fortunate for the American people if their feeling and intelligence were sufficiently aroused upon this subject to compel politicians to stop and consider a measure of such vital national importance in the year of a Presidential election. In this bill, however, no provision is made for the proper training and education of forest officers, and yet forest administration, however wisely the laws upon which it rests may have been drawn, must depend for ultimate success upon the intelligence and enthusiasm of the officers who direct it.

Mr. John Robinson, as has already been explained in an earlier issue of this paper, has very wisely suggested that we must first have a forest school in this country modeled on the plan of the Military Academy, before we can hope to have forest officers thoroughly trained in all the difficult technicalities of forest management, or an efficient forest administration. The men will appear, no doubt, to manage the forests, when the Government decides to protect them, and they will manage them badly at first, and then in time very well, but no general forest policy is complete or adequate to accomplish the ends in view without some provisions for training forest officers, any more than a law to establish a standing army could be complete without provisions for training its officers.

It is true that many investigations are yet to be made upon the position, the extent and the character of our western forests before enough is known about them to locate properly forest reserves, or to organize an effective system of forest administration; but some beginning must be made. If this measure fails it might be well if all friends of the forest would unite in an effort to secure from Congress the withdrawal of the whole forest-covered public domain from sale and entry, with adequate temporary measures for its strict protection, and the appointment of some competent body, selected for example from the National Academy of Sciences, to study the whole question in all its complex bearings and to recommend some comprehensive scheme of forest administration. There could be no opposition to such a bill except on the part of those who prey on the public forests. Such a measure might diminish at once many of the dangers which now threaten to exterminate the western forests, and it would cause the subject to be studied and discussed in a manner which would compel Congress eventually to establish a permanent forest administration in this country. But whatever method is adopted one thing is clear, that unless Congress does something and does it quickly, there will be very little forest left in western North America, and the future of all that part of the Continent will be irretrievably ruined.

Flowers in Winter.

THE skill of American gardeners in growing flowers for winter cutting, and the lavishness of the American public in buying them, strike every visitor to our large towns. In no other country are flowers—especially Roses—forced in such perfection or profusion, and in none are they used in such quantities, not only on all social occasions, but for the daily adornment of the drawing-room and dining-room.

It is hard to say whether our passion for cut flowers reveals a love for nature or simply a love for beauty in general. But it certainly is not, as some would have us believe, a mere fashionable craze, with no more respectable foundation than extravagance and the desire for display. Fashion's freaks do not last for generations, and grow stronger and stronger in their influence year by year. But our love for cut flowers in winter has thus lasted and grown. A few years ago fashion certainly played a large part in determining the uses to which we put such flowers. No lady was content to appear in a place of public amusement without an immense bunch of flowers in her belt, and few were content to take their afternoon stroll unless similarly adorned. The request that no flowers may be sent which even now often follows a funeral announcement in the papers—though not so often now as a few years since—is an unmistakable sign that a custom which, when not carried to excess, is among the most beautiful and touching of modern times, had been carried to excess—had become a fashion that was felt as a tax upon the friendship of the giver and a burden upon the conscience of the recipient. And so strong for a while was the feeling that a lady could not go to an opera or a ball without bearing costly tokens of the regard of her friends, that young men of moderate means were almost driven out of social life and the florist's bill came to rival the tailor's as a synonym for one of the worst terrors of city existence.

But all these things have changed of late; and in the change we may read signs of our growth in a real love for flowers, as well as in good taste and refinement of feeling. For the florist's trade has certainly not suffered in consequence of the fact that we use flowers less for the purposes of a display than in years gone by. If we do not buy so many flowers to give away in a semi-obligatory manner, we buy more for ourselves; and if we do not carry them about so much in public, we care more to have them with us in our rooms. Many of us can remember when a lady often placed her baskets of flowers in her front window, between the curtains and the glass—sacrificing her own enjoyment so that every one else might know of her good fortune. Such vulgarities no longer offend the sight, but behind the curtains there are more flowers and lovelier ones than there ever were before.

The increase in the variety of flowers which we now force for winter use, and the simple character of many of them, also prove our advance in the right direction. Thirty years ago the Camellia ruled almost alone in our drawing-rooms. Then Roses began to come into favor, but they were as inferior to those of to-day in quality as they were in variety. It is scarcely twenty years since the most beautiful and fragrant of the other flowers we now demand were introduced into the winter trade—the Hyacinths and Lilies-of-the-Valley, the Daffodils and Narcissus and Tulips, which may now be bought any day in the winter for a few pence at any street corner, bringing into humble homes the loveliness which in former years was a luxury for the rich alone. The first bouquet of Lilies-of-the-Valley which was seen in a New York ball-room—some twenty years ago—was the talk of the town for days, and the florist who had grown the few sprays which composed it, and the young man who had bespoken them long in advance of their blooming, were looked upon as marvels of inventiveness and enterprise. These blossoms and their fellows had before that time been considered "common garden flowers," unworthy of a place in a florist's window or a lady's hand when winter made their acquisition difficult. But one experience of their charm among the time-honored favorites of the drawing-room, gained a place for them in popular affection, which has enlarged itself year by year. More recently other "common garden flowers" have likewise come to rank as winter favorites—Lilacs, for example, and the Mignonette, Forget-me-nots and Chrysanthemums; and we believe that even the growing fancy for Orchids—a fancy inspired as often by the fact that they are rare and singular, as by the fact that they are beautiful—will not drive into even temporary retreat the simpler, cheaper flowers, which prove that our love for natural beauty is a healthy and a steadily developing sentiment.

A Plantation for Winter.

THE value of some deciduous shrubs with regard to their winter beauty is hardly appreciated. We think much of the flowers and foliage of our shrubs, little of the brightness and persistency of their fruit, or of the color which their twigs retain when their leaves have fallen. Yet the number of such plants which are decorative throughout the whole or a part of the winter is considerable. The finest and most beautiful is the Cockspur Thorn, a small and graceful tree which can be used as the centre of a winter group. Its large dark-red fruit is borne in great profusion, and remains conspicuous in the winter landscape until the days of early spring. Among smaller plants the common Barberry is the most valuable for winter planting. Its habit is graceful and its drooping racemes of fruit are brilliant objects throughout the entire winter. Less pleasing in habit but with fruit equally persistent and even brighter in color is Thunberg's Japanese Barberry.

The common Privet, one of the hardiest and most easily cultivated of plants, carries in this climate its bright black fruit well into April. Several of our native Roses also retain their showy red haws until spring, especially the tall-growing Carolina Rose, and, among dwarfer species, *Rosa humilis*, *R. blanda* and *R. nitida*. The conspicuous fruit of our native Bitter-sweet—orange-colored and red—remains upon the plant all through the winter season, and its free habit of growth will add a welcome touch of variety to the group of shrubs among which it may be planted. The Japanese Rhodotypus is another winter fruit-plant, although its greatest beauty consists in its pure white flowers and neat foliage. And to this list of shrubs which do not lose their fruit until the days when fresh foliage is ready to replace them, may be added many others which retain theirs for at least a portion of the winter. The different Spindle-trees are striking objects in late autumn and early winter; but although their brilliant crimson fruit is persistent through winter, it becomes dull and inconspicuous by the end of the year. Few plants are more beautiful in autumn than the Highbush Cranberry (*Viburnum Opulus*) with its load of orange-scarlet fruit, but the birds devour this so greedily that little is left at Christmas-time. Every one knows the beauty of the Black Alder as it blazes through our northern swamps during the autumn months, and although a native of swamps it grows freely in any garden soil. If planted for the sake of its fruit care should be taken to secure plants of both sexes. Its scarlet fruit generally disappears by Christmas, but in his account, recently printed in these columns, of the effects of the great spring storm in New Jersey, Dr. Abbott speaks of seeing the Black Alder loaded with its fruit resting upon the dazzling drifts of March snow. The Snowberries, white and red-fruited, are beautiful in autumn, but they also lose their beauty later in the year.

And the winter shrubbery can be enriched by many plants conspicuous by reason of their bark. Scarlet-twigged Dogwoods, Golden-barked Willows, the Kerria with its shining yellow branchlets and many others may be grouped with fruit-bearing plants to produce an effect of striking and of lasting charm. All these plants are beautiful in spring and summer as well as in winter, and some of them are among the most desirable shrubs for summer-planting that we have. Therefore it need not be thought that in planting for winter beauty we should detract from our pleasure at other seasons of the year. All we need to do is, while planting for summer, to think a little of winter too. A little thought will enable us without any sacrifice in other directions to produce delicate combinations of form and color upon which the eye will rest with satisfaction throughout the long weeks of snow and cold. It is ignorance or indifference rather than necessity that has led us to rely so entirely upon dusky evergreen foliage in our efforts after winter beauty.

The death is announced of Jules Emile Planchon, the distinguished Professor of Botany at Montpellier, at the age of 65. Although a systematic botanist by training, Planchon's predilections were for horticultural and economic botany; and of late years he has devoted himself specially to the study of the Grape-vine, and of its greatest enemy, the Phylloxera. He was sent to this country by the French Government in 1873, to prosecute these investigations; and on his return to Montpellier he made an interesting and valuable report upon the subject. His last important publication is a monograph of the Grape-vines and the other plants of the Ampelopsis Family, in which some new North American genera and several new North American species are proposed. This, the latest contribution to the botanical literature of the Grape, occupies the second half of the fifth volume of DeCandolle's Continuation of his Prodromus, for which Planchon had written a monograph of the Elms, Hackberries and other genera of the Nettle Family.

A Curious Vegetable Growth on Animals.

It is a well known fact that in certain diseases of the skin and hair which occur in man and mammals there are found fungi of rather a low grade of organization which by many of the medical profession are considered to be the cause of the diseases. In many of the lower animals, also, parasitic fungi are found, so that the discovery of a new fungus growing on animals would cause little surprise. But the case is different in respect to algæ, lower plants which, unlike fungi, have green coloring matter in their cells. In a few animals which are low down in the scale of existence green algæ are occasionally found, but, in such cases, the algæ are not usually considered to be parasites in the ordinary sense. The algæ and animals are assumed rather to be living together in what is called a state of commensalism—that is, the algæ furnish in some way food for the animals while the latter provide food for the algæ.

A curious case in which algæ seem to live as parasites on animals has recently been studied by Mme. A. Weber van Bosse. It is a fact known to zoologists for some years that the hairs of some of the species of sloths have a greenish color. It had been suspected and partly demonstrated that the green color was due to some plant growth. The researches of Mme. Weber van Bosse show conclusively that such is the case, and she describes minutely and figures the species found in the hairs of *Bradypus* and *Choloepus*. The algæ described belong to two genera—*Trichophilus*, in which the cells are grass-green and give out zoospores like many small algæ found in salt and fresh water and also on trunks and trees in wet places; and *Cyanoderma*, in which the cells are violet colored like some plants of the Nostoc family. The home of the sloths is the damp, shady forests of the tropics, and there we might expect such algæ to grow on animals of a sluggish habit, especially if they live among the damp foliage of the branches, as is the case with the sloths. But we should hardly expect that those animals confined in the zoological gardens of Europe would have their hairs covered by the same algæ. Such, however, appears to be the fact.

W. G. Farlow.

Last Year's Leaves.

As I walked yesterday along a wooded hillside, over tree-margined fields, and skirted a swamp too wet, as yet, to thread, I noticed many a tree with last year's leaves still on it. Except one Tupelo, which usually drops its foliage earlier than our other forest trees, these leaf-bearers were all Oaks or Beeches. Thoreau speaks of the White Oaks about Concord retaining their leave as a rule, and others deny that this is true, or more than an occasional occurrence.

The conclusions derived from my own memoranda, covering many years, and of my ramble of yesterday particularly, are that not only the White Oak, but several other species, do retain their leaves, or a considerable percentage of them, until early in May of the next year. Take any Oak grove in this neighborhood, and I think it will be found, if the trees are not too crowded for healthy growth, that fully three-fourths of them retain from one-tenth to one-half of their leaves. But when we come to consider single trees, this habit of leaf retention will be found one of many curious features. For instance, I know of many single trees, both Oaks and Beeches, that have a single limb that will retain its foliage the winter through, while the other branches are bare from November to May. Again, a tree that stands upon the edge of a wood will hold its leaves on the open, light and airy side, and drop those that grew upon the shaded limbs. Does the greater vigor of the foliage upon the sunny side explain this?

In one of my upland fields there stands a thrifty Scarlet Oak, that is noticeable for the beauty and density of its foliage. In October the deep green becomes a rich maroon, and later, a lighter and brighter red, and not until

nearly New Year's has the ruddy tinting given way to brown. Even then the tree remains a prominent object, and is, indeed, even for an Oak, one among a thousand. For the past fourteen years this tree has never failed to retain nearly all its leaves, although in that time there has been every variety of summer and winter that even the powers in charge of our capricious climate could invent.

On examination of the Oaks near by, it has seemed to me that they all have a tendency to retain their leaves, and the measure of success in each case is due principally to the exposure of the tree and its general vigor. Here I may be wholly at sea, and only too glad to be informed correctly, if in error.

What I have said of Oaks applies equally to the Beech. Given shelter from the north-west winds and average vigor, and many a leaf will cling to its parent stem, until the swelling leaf buds of the new year shall crowd it from its place.

While yet the drifts of the late great snow storm still lingered, it was a pleasant feature of the landscape to see the sapling Beeches still bearing aloft their last year's leaves, dimly glittering like wrinkled fragments of old gold, and filling the air with a bell-like tinkle, soothing and soft as the twitter of a bird.

I offer it as a hint to the landscape gardener, to bring about by selection, if it can be done, a fully established habit of leaf retention; not making evergreen Oaks, but winter-long, bright brown Oaks; for such now lessen, to a marked degree, the dreariness of many a winter outlook. Again, when leaf retaining Oaks are mingled with Evergreens, there is an added charm to the scene. Think for a moment of such a cluster as this: A background of Cedar, scattered Oaks with dark brown leaves, a Beech with golden foliage, and crimson-fruited Black Alder mingled through it all. This may be readily brought about, for I saw it yesterday, where Nature had, without man's aid or interference, made thus beautiful the corner of a long neglected field. *Charles C. Abbott.*

Near Trenton, New Jersey, April 5th, 1888.

How the Mangrove Forms Islands.

AMONG the agencies that have helped to build up the peninsula of Florida may be numbered certain trees which are fitted by nature to grow on lands that are more or less under water and that are too unsubstantial to support other forms of vegetation. Like the coral builders, they work so slowly that in a single century no great change is accomplished, but in thousands of centuries the changes wrought are very great. The most important of these tree-workers are the Mangrove and the Cypress. The former grows on shores and shoals that are overflowed generally by salt tide-water; the latter in localities that are overflowed at times by fresh water. Both have similar obstacles to overcome and they accomplish by this very different means.

The Red Mangrove (*Rhizophora Mangle*) covers hundreds of square miles of the southern shores of Florida, the principal areas occupied by it being the shoals lying between the keys and the mainland—which are composed of calcareous sediment—and the low southern and western borders of the Everglades. In these localities and on tide-washed islands as far north as latitude 29°, it forms a dense thicket of vivid green, rising uniformly from high-water-level, unchanged by seasons, unaffected by hurricanes, insidiously encroaching on the domain of waters and helping build what in future ages will be dry land. Far in the interior, even on the northern border of the State, are found beds of calcareous sedimentary rock which may once have supported just such thickets of Mangrove.

In places on the mainland shores the Mangrove attains to tree-like dimensions, forming a tall trunk sometimes two feet in diameter. Like the Cypress, the Mangrove is provided with strong buttresses at the base, but these differ from those of the Cypress in being of the style called by architects "flying" buttresses. Starting from the trunk a yard or two from its base, they descend in graceful curves, sending off branches, from which other branches proceed, all descending in similar curves to the muddy ground, over which the tides spread twice a day. These basal branches serve the double purpose of props and feeders. From the upper branches, aërial roots descend till they reach the water at high tide. Sometimes a tree may be seen entirely dead except as to one branch, which is kept green by sucking up water through an aërial root perhaps twenty feet long.

Another special provision for its environment is seen in the seed of the Mangrove. This, before falling from the branch, develops into a miniature trunk from six to twelve inches long. The basal end being the heaviest, it is most likely to strike the muddy surface first and to stick there in an erect position. The rootlets and seed-leaves being ready to push forth, the young plant makes a rapid growth and soon becomes well rooted and propped in its rather insecure position.

As the Mangrove usually grows, rising scarcely ten feet from the water and spreading laterally, the main stem is of little importance. Innumerable roots descend from and support the leafy branches, repeatedly forking in their descent and forming a sort of basket work below high-water-level. Floating objects become lodged in these natural weirs, shell-fish and other marine creatures multiply in them, and the submerged stems give support to sea-weeds and hydroids. In some localities the roots become encased with oyster-shells, and this, probably, is the origin of many of the oyster-bars that obstruct some of the lagoons or so-called rivers of southern Florida.

The Mangrove thickets in the course of time build up a foundation for other species. Of these none have a peculiar habit of growth, except the Black Mangrove (*Avicennia nitida*). This tree is remarkable as to foliage, fruit, wood, bark and roots. The surface-roots send upward innumerable short feeders, black, lithe and rising about a span above the surface. This function, evidently, is to draw nutriment from the water at high tide, and, like the knees of the Cypress, they add to the surface accumulations, which, from age to age, add to the elevation of the land. In this respect, however, neither of these trees equals the Red Mangrove.

The wood of the Red Mangrove sinks in water and is not attacked by marine worms. Hence, fallen branches and trunks remain where they fall, while material that floats in with the tide is detained by the network of basal branches. It is altogether probable that the thousands of tree-covered "islands" in the Everglades and Big Cypress were once Mangrove thickets and that the present Mangrove islands will in time be added to the mainland. As soon as they are elevated above the overflow of the tides, the Mangroves will give place to species that require only brackish soil, which, in turn, will be replaced by fresh water or inland forms of vegetation.

Jacksonville, Fla. *A. H. Curtiss.*

Certain Cone-Eating Insects.

THE cases here mentioned are the only ones known to us where the cones of Spruce and Pines have been attacked by insects. It is well known that the Spruce bud louse (*Adelges abieticolens*) deforms the terminal shoots of the Spruce, producing large swellings, which would be readily mistaken for the cones of the same tree. Another species of bud louse (*Adelges abietis* Linn.), which appears to be the same as the European insect of that name, we observed several years since (August, 1881), in considerable numbers, on the Norway Spruces on the grounds of the Peabody Academy of Sciences at Salem. A species of caterpillar (*Pinipestis reniculella* Grote), was observed August 24th, in considerable numbers, on a young Spruce ten to twenty feet in height at Merepoint, on Casco Bay, Maine. The cones on the terminal shoot, as well as the lateral

upper branches, which, when healthy and unaffected, were purplish green and about one and one-quarter inches long, were, for the most part, mined by a rather large Phycid caterpillar. The worm was of the usual shape and color, especially resembling a Phycid caterpillar not uncommon in certain seasons on the twigs of the Pitch Pine, on which it produces large unsightly masses of castings within which the worms hide.

The Spruce cone worm is usually confined to the young cones, into which it bores and mines in different directions, eating galleries passing partly around the interior, separating the scales from the axis of the cones (Fig. 18). After mining one cone the caterpillar passes into an adjoining one, spinning a rude silken passage connecting the two cones. Sometimes a bunch of three or four cones are tied together with silken strands; while the castings or excrement thrown out of the holes form a large, conspicuous light mass, sometimes half as large as one's fist, out of which the tips of the cones are seen to project (Fig. 19). Besides these unsightly masses of castings, the presence of the caterpillars causes an exudation of pitch, which clings in large drops or tears to the outside of the adjacent more or less healthy cones. Where much affected the young cones turn brown and sere.

Fig. 18.—Single Pierced Cone.

Fig. 19—Mass of Infested Cones.

The same worms had also attacked the terminal branches and twigs of the same tree, eating off the leaves and leaving a mass of excrement on one side of the twig, within which they had spun a silken gallery in which the worm lived.

On removing the bunches of diseased cones to Providence, one caterpillar transformed in a warm chamber into a moth, which appeared the end of October; its metamorphosis was probably accelerated by the unusually warm autumnal weather then prevailing. All the others had, by the 1st of November, spun within the mass of castings a loose, thin, but firm, oval cocoon, about half an inch long and a quarter inch wide, but the larvæ had not yet begun to change to chrysalids. Whether in a state of nature they winter over in the larval state within their cocoons, or, as is more likely, change to pupæ in the autumn, appearing as moths by the end of spring, remains to be seen.

I only found one tree next to my house thus affected by this worm. In 1887 the tree was not so seriously affected, though its general appearance had not much improved. It is probable that in a dense Spruce growth the trees would be less exposed to the attacks of what may prove a serious enemy of shade Spruces. The obvious remedy is, to burn the affected cones and mass of castings late in summer.

Fig. 20.—Spruce Cone-worm (enlarged).

The foregoing account has been taken from our fourth report on insects injurious to forest and shade trees, in Bulletin No. 13 of the U. S. Department of Agriculture, Division of Entomology, to which we are indebted for the accompanying illustrations, drawn by the artist of the Division, Miss L. Sullivan.

Another cone-eating insect is a bark beetle, *Dryocœtes affaber*. We have found this beetle in great abundance mining the bark of the Spruce, near the timber line on Gray's Peak, Colorado; it occurs, however, throughout the northern States. Mr. W. H. Harrington, of Ottawa, Canada, sent us, in December last, a specimen of this beetle (Fig. 21), which he doubtfully referred to this species, and which we find is identical with our Colorado examples. He has given us the following account of its habits: "The cones of the Pitch Pine were found to be, during the past season (1887), frequently inhabited by this bark borer, both beetle and larva. Their attacks were readily noticed by the small aborted cones. The terminal shoots of the branches seemed also sometimes infested by the same beetle. It seems larger than a beetle which I found a few years ago boring into the terminal shoots of the White Pine, and which you determined as *D. affaber*."

Fig. 21.—Moth of Spruce Cone-worm (enlarged).

A. S. Packard.

Foreign Correspondence.

The Kew Arboretum.—III.

BEFORE entering into a detailed account of the more important genera in the Kew Arboretum, it may be well to give a few particulars about some of the finer specimens, and a note or two concerning the history of others.

A fine Persimmon (*Diospyros Virginiana*) near the Temple of the Sun is one of the original denizens of the Old Arboretum, and was presented with many other rare and curious trees by the Duke of Argyle to George III; it is a handsome plant—apparently as happy as in its native habitat—and measures upwards of 60 feet in height, the trunk girthing 5 ft. 4 in. at a yard from the ground; the head has a spread of about 30 feet.

A conspicuous object at the present time (March) is a fine specimen of the Constantinople Hazel (*Corylus Colurna*) laden with catkins; it has a spreading head 44 feet across, is 35 feet in height, and the stem measures 4 ft. 3 in. in girth at three feet from the ground. According to Loudon this species was introduced to Britain in 1665; the following memorandum from "Hortus Collinsonianus" is worth reproducing. "The Turkey Nut, in the Mill Hill Garden, is very remarkable from all others, for the husk rises high, and branches out every way, and covers the nut. This is a remarkable acquisition, for the Captain that brought them from Turkey, eating them in a drinking room, one of them dropped into the crack of a rotten window board, where it took root; my gardening friend Mr. Bennett, coming there and seeing it, transplanted it to his garden, from whence our tree was a layer, and brought here anno 1756."

The history of the first introduced plants of the Chili Pine (*Araucaria imbricata*) is as follows. Towards the very close of the eighteenth century the officers of the Vancouver Expedition were at a dinner given in their honor by the Viceroy of Chili. Menzies, the surgeon and naturalist attached to the Survey, noticing that part of the dessert consisted of nuts which were new to him, obtained a few which he planted in a box of earth on board his ship. Several germinated and five plants were safely deposited at Kew. These were grown under glass for many years, and the old Kew plant—perhaps the only survivor—even after being planted in its present position, was protected

by a wooden structure for many successive winters. Far more handsome specimens are to be met with than this—which dates from 1796—but its historical associations make it worthy of mention. It measures 34 feet in height and has a spreading round head quite similar in outline to those sketched in their native forests by Miss North; the stem is 3 feet 10 in. in girth at three feet from the ground.

The large *Sophora Japonica* near the newly constructed rockery for hardy Ferns is not only one of the original occupants of Aiton's Arboretum, but it is one of the three or four plants first introduced into Britain. It flowers profusely every year, but never seeds; although perfectly hardy our summers are not hot enough for pods to be developed. (In northern France do the same remarks apply. During a continental trip last August I saw no pods until I had got well into the southern districts beyond the Loire.) The Kew plant is about 50 feet in height, with a stem 13 ft. 6 in. in girth; it divides into numerous massive branches at about the height of a man and some of these are bound together by strong iron chains—the head has a spread of about 75 feet. Some other specimens at Kew are almost equally fine, and one, planted in a wood, where it had been prevented from developing too much laterally, has a fine clear stem of thirty or forty feet.

Not far from the Sophora just described is probably the finest Hop Hornbeam in the British Isles. This is not the Hop Hornbeam or Iron-wood of the north-eastern United States, but its European representative (*Ostrya carpinifolia*), and, in my opinion, a more ornamental species than the American plant. It is 50 feet in height, with a trunk 9½ feet in girth and a spreading head of upwards of 70 feet wide. This, although it is annually laden with its curious hop-like catkins, does not ripen seed at Kew.

The Corsican Pine (*Pinus Laricio*) near the Grand Entrance is a remarkably fine example of the species, and, moreover, has an interesting history. After peace had been proclaimed in 1815, it was brought to England by the botanist Salisbury. It was then a small plant, about six inches high, in a pot; the measurements now are: height 90 feet (several feet have been broken off the top by snow storms during the last dozen years); spread, 60 feet; girth of trunk at 4 feet from the ground, 9 feet. *P. Laricio* is a valuable timber tree, a fast grower, and stands the rough sea breezes well, besides being almost proof against game when young. Possessing these advantages, it is not surprising to find that it is now being largely planted in many places.

Ginkgo biloba, the tree formerly only known in gardens as *Salisburia adiantifolia*, or the Maidenhair tree, is perfectly hardy at Kew and grows freely. Our largest specimen is upwards of 56 feet in height, with a head 42 feet in diameter, and a trunk 9 feet in girth at a yard from the ground. Formerly this specimen was trained against a wall like a fruit tree, but the building being removed the tree was left, and the side branches cut away. This tree, too, like many others which flourish well at Kew, does not flower, although it is on record that when enjoying the shelter of the wall it did produce male catkins.

The largest of the Turkey Oaks (*Quercus Cerris*) in the Kew Arboretum, is one growing near the Temple of the Sun. This was also presented by the Duke of Argyle. It is a noble specimen 85 feet in height, the spreading head being 96 feet through, and the trunk 15 feet 6 inches in circumference a yard above the ground. As a timber tree, in Britain at any rate, this species is not of much value, but the South African forest authorities are planting it largely. The great importance of growing belts of Oak in the South African forests is that they are trees which by their dense shade keep down the grass, the burning of which does so much damage to the forests every winter. The Turkey Oak being better adapted to the climate of South Africa than the common Oak (*Quercus pedunculata*), its extended propagation is, according to the Conservator of Forests stationed at King Williamstown, of the first importance.

Royal Gardens, Kew. *Geo. Nicholson.*

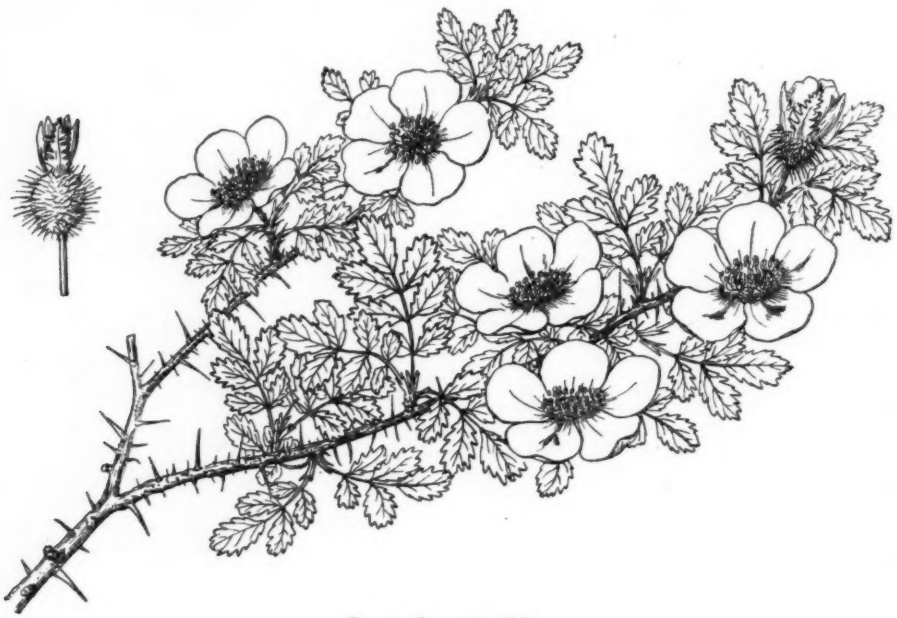

Fig. 22.—Rosa minutifolia.

New or Little Known Plants.

Rosa minutifolia.*

OUR wild Roses have an ill reputation among botanists for the uncertainty which often attends the determination of their species. But there are some, fortunately, about which there can be no doubt, and we have

*R. minutifolia, Engelm. in Bull. Torr. Club, ix. 97. Of dense growth, 2 to 4 feet high, pubescent, with numerous scattered terete straight or slightly curved spines; leaves small, with narrow stipules, the leaflets 5, round to lanceolate, 1 to 5 lines long, incised-dentate; flowers an inch broad or less, pink or white, solitary on short tomentose peduncles terminating very short branchlets; receptacle globose, densely setose-hispid, the calyx-segments cleft, persistent; styles distinct.

here given the figure of one which carries its distinctive characteristics obtrusively to the front, and cannot be mistaken. Not only is there no other American Rose like it, but it stands alone in the genus, forming M. Crepin's section, *Minutifoliæ*. Its compact habit, its very small and deeply toothed leaflets, and its small, solitary flowers almost sessile upon the short branchlets, together make it a very distinct species.

As might be expected, this Rose belongs to the flora of the Pacific coast. It has been found only on the peninsula of Lower California, near All Saints (Todos Santos) Bay, about 40 miles south of San Diego, where it was discovered in 1882, forming low, dense thickets upon the dry hillsides bordering the shore. It is a much-branched, compact shrub, armed with numerous stout, straight spines, the small leaves often fascicled, and with numerous pink or white flowers along the branches. The globular base of the calyx is covered densely with short bristles. Evidently the flower in its wild state cannot be commended as well suited to the florist's needs, but from its habit of growth the plant may well prove a decided ornament to the lawn and garden in our more southern States, where it would doubtless be hardy. *S. W.*

Cultural Department.

A Selection of Lilies.

THE selection of varieties is an individual work to be settled by the grower in accordance with his personal taste and the amount of space and money he has at command.

For a garden of moderate size the twelve species and varieties named below would well represent the whole family and furnish continued bloom from June until September.

Lilium auratum, the golden-banded Lily of Japan, is one eagerly sought, because of its large, showy flowers. As a garden flower it has few equals, if magnificent display is the object sought. As a cut flower for house decoration it is the least desirable of any of the family. It is too large to arrange with others, with a due regard for harmony of form and color, and the fragrance it exhales is truly sickening. Of this species there are many garden varieties, differing only in the markings. In some the golden band gives place to one of bright crimson, which for a day is showy, but the crimson soon fades into a dirty brown and the beauty of the flower vanishes. None of these varieties equal the original type. This is usually considered a difficult subject to manage. Choose the smallest bulbs, those that are heavy and firm, plant deeply, say eight inches, in the driest part of the border, in partial shade, and the bulbs will last a number of years.

L. elegans is sold in many forms under the name of *L. Umbellatum*, and its varieties, *atrosanguineum*, *fulgens*, etc. Orange is the predominating color, with various shades; a few are deep crimson and quite showy; some are a clear citron in color; some are self-colored, others deeply spotted. Alice Wilson, a variety of recent introduction, is decidedly the best of its class. The flower is perfect in form, with petals broad, full and gracefully curved. Its color is a clear, lemon-yellow, deepening towards the centre of the flower to a rich golden yellow. The class is valuable, because of earliness, hardiness, and profusion of bloom. A large clump makes a magnificent display. The flowers are generally too coarse for table or parlor decoration.

L. Brownii, which is also known as *L. Japonicum*, a native of China, is remarkable for its long trumpet-shaped flowers, ivory-white inside, and dark purple on the outside. This is usually regarded a tender Lily, and is not much grown because of its liability to perish. This opinion is quite erroneous. I know a clump of more than a hundred bulbs, all of which have come from six bulbs planted some ten years ago in a raised bed, which has not since been disturbed. Many of the bulbs furnish eight flowers each, and the display is such as only this stateliest of flowers can make.

L. candidum, the old and well-known white Lily of our gardens, is the one we could least afford to lose. For graceful habit, stainless purity, and delightful fragrance it has no peer. It is fitted for any place, and for all occasions where cut flowers are desirable. It is about the only flower we do not like to cut, and that because it is too noble and pure to meddle with. This bulb should be removed in August, and not be suffered to remain long out of ground; it commences its autumn growth the last of August, and upon this growth its next year's bloom depends. A blight has visited the Lily in many parts of this country, the cause of which no one has been able to discover, neither has there been found for it a remedy.

L. excelsum, or *testaceum* of many catalogues, is another noble Lily closely allied to the *L. candidum*, and resembling it in habit of growth. Its flowers are drooping, with reflexed petals of a delicate nankeen color, with the minor petals covered with darker warty spots. Its fragrance is delicate and pleasing.

L. speciosum, or, as it is more commonly known, *L. lancifolium*, is the most useful of all the Lilies. In point of beauty it ranks next to *L. candidum*, and is far more useful when cut. Of this species we should not be content with less than four varieties. Var. *præcox* is a strong grower, producing when well established twelve to fifteen very large, pure white flowers on a single stem, with regular and much reflexed petals often clasping the stem; in the centre of the flower the petals are studded with delicate little projections, like crystal points. Var. *purpuratum* has the same general habit, but is a taller and stronger plant, with dark rose-crimson flower whose petals, at the base, are seemingly rugged with rubies and garnets, while the edges are bordered with white. Var. *punctatum* differs in habit of growth but little from those already noticed, its flowers being pure white, delicately studded with light rose-colored spots. Var. *roseum*, or *rubrum*, is the most common and best-known of all the varieties. Much confusion exists in regard to its variety name. Some dealers call it *roseum*, others *rubrum*, many send it out under both names; the result is, if you buy one you have both, if you buy both you have but one, which one it matters but little. Its color is between that of *L. punctatum* and *L. purpuratum*. There are nearly fifty varieties of this species catalogued; the four described are fairly representative, and for a general display no more are required, while for a good collection neither could well be omitted.

L. longiflorum, the trumpet-shaped Lily, is conspicuous among Easter flowers, as it is well adapted for forcing. The popular Bermuda Lily belongs to this species. It thrives well in the open border, but it is folly to plant it unless thoroughly protected against frost.

L. tenuifolium is the earliest of all Lilies to bloom in the open border and one of the most remarkable, because of its brilliant scarlet flowers, borne in terminal clusters on very slender stems, which are beautifully clothed with grass-like foliage.

L. tigrinum flore pleno, although one of the much despised Tiger Lilies, is, when well grown, a noble and beautiful plant. I have had a single plant grow more than five feet high, with a diameter of more than three feet, bearing in a single season more than sixty flowers, and continuing in bloom fully six weeks. The flowers are orange-scarlet and very double.

Finally, let me say, that in making a selection one cannot well go wrong, for there is not a species or variety that is unworthy of a place in the garden. You will succeed if you deserve success, and you will be sure to increase the number of varieties annually. You will also observe that your investment has been relatively small, as plants that are steadily and rapidly increasing in number, though they may cost one dollar each when you begin, are, in the end, much cheaper than those that require to be removed every year, like all the popular bedding plants. *C. L. Allen.*

Kitchen-garden Notes.

Asparagus.—For private use, plant in rows 3 to 4 ft. apart, 18 to 24 inches asunder in the row, and the top of the crowns 5 inches below the surface of the ground, which we do not raise into ridges at all. Marketmen plant 2 to 4 inches deeper, and in spring plow the earth from between upon the top of the rows in order to get white shoots. By sowing some seed in spring, we can keep up a supply of plants for new plantations or for filling up gaps in old ones.

Beans.—In light, sandy land sow snap beans about the 17th or 20th of April, but it is not safe to sow them before the 24th. Valentine is the best of green-podded varieties; it does not rust or spot; Golden Wax is the best of the yellow-fleshed kinds.

Beets.—Sow Egyptian or Eclipse in rows a foot apart.

Cabbage.—As soon as young plants of early Wakefield are well hardened off, plant them out in rows 2 ft. apart.

Carrots.—Sow a little Early Horn, Scarlet Stump-rooted and Danvers—the first a foot apart, the others 15 or 18 inches.

Cauliflower.—Treat like Cabbage, only be more careful in having the plants well hardened off and the ground warm and rich; indeed, if the plants can be well taken care of, and the out-door conditions are not quite favorable, delay planting till about the 20th. Early Snowball is best.

Celery.—Sow some Golden Heart and White Plume in a cold-frame. I do not sow the main crop till the last week in April, but this will be too late for less favored localities.

Cucumbers.—Sow Tailby's or Nichol's on sods or in pots in a hot-bed and plant out in May.

Egg Plants and Peppers.—Keep them growing in pots in hot-beds, snug and warm and well covered up at night. They are very tender. There is nothing better than New York Improved Egg Plant or Ruby King Pepper.

Lettuces.—Those sown last week in March in hot-beds are now fit for transplanting. Set them out among other crops, say between Cabbage and Cauliflower plants or between rows of Peas. Sow again, this time out-of-doors, for succession. Salamander and White Summer Cabbage are good for summer use. Every kind of Lettuce will fail in hot weather.

Onions.—For seed Onions select well-manured rich ground. After it has been well pulverized, tread or roll it to make it firm, then draw drills an inch deep and 15 to 18 inches apart; sow, cover and tread or roll. I prefer Yellow Danvers, Southport White Glove and Wethersfield Red. Or for early use plant sets, and the larger they are, the earlier they will be fit to use.

Parsnips.—Sow a little seed now and the main crop about three weeks later. Use deeply-worked rich soil, and have the rows 20 or 24 inches apart. Get the Student or Long Smooth.

Turnips.—Make a small sowing once a fortnight. I much like the Strap-leaved sorts, also Purple-top White Globe. Early sowings are much troubled by worms in the "bulb."

Herbs.—Have some Mint, Thyme and Tarragon growing permanently; and from seed every spring raise some Chervil, Savory and Sweet Basil.

Fruit Garden Favorites.

AMONG the old Strawberries none please me so well as the Downing. There are more highly flavored varieties, and those more beautiful, but there is something in the quality of the Downing that leads me each season to the spot where it grows. Under good culture it is large and productive, but in some localities it is subject to leaf blight, so called, caused by a fungus growth.

Next to the Downing for the amateur I would place Mt. Vernon. It is attractive in flavor, productive and vigorous, but too soft for market. This, like many others, has been overlooked by many, in the crowd of new varieties that have been offered, yet it has friends everywhere, and will be planted more and more each season by those who appreciate a good Strawberry. Triomphe de Gand and Jersey Queen are both superior in quality to either Downing or Mt. Vernon, but usually will not yield half as much fruit, and in many localities are exceedingly fickle. Indeed, the Durand strain of Strawberries, to which Jersey Queen belongs, has proved uncertain with me as a rule, and also with many others. Parry and Jewell, of the same strain, while among the best of the family, are variable, the Jewell far more so than Parry, the latter proving to be a valuable early variety in many localities. It varies greatly in quality, however, in the same row the same day, a peculiarity which I have not noticed in any other variety. Among the newer varieties Jessie excels in quality united with productiveness, and Bubach in size, beauty and vigor.

It is a disputed question whether Strawberry beds should be cultivated during the spring, or bearing season, but weeds must be subdued, and shallow hoeing early in the season does no harm. Where the winter mulch is left between the rows it has a tendency to cause later ripening and increases the danger from frost, but otherwise the mulch is beneficial. If the soil is not fertile enough commercial fertilizers may be applied by hand, if care be taken not to permit them to touch the foliage. They should be mixed with the soil at

The Alameda of Chihuahua. *Populus Fremontii*, Var.—(See page 101.)

Parsley.—Sow a row of Double Moss Curled at once in good ground. Old roots are persistently running to seed. Raise a fresh supply every year. For wintering in frames sow again about midsummer; this sowing will not "bolt" till next spring.

Peas.—Sow nothing but wrinkled marrow Peas. Alpha sown now will give peas fit for use about the 10th of June; McLean's Advancer, about the 15th or 25th, and Stratagem about the 20th. Owing to season and conditions of cultivation these dates may vary. Sow all these varieties on the same day and with successions of Stratagem or Champion of England every ten days. Champion is the best Pea grown—but it is too tall.

Radish.—Sow a small row once a week; they are fit for use four weeks after sowing. French Breakfast as a Turnip Radish, and Wood's and Chartier's as long Radishes, are good.

Rhubarb.—A barrel set over the stools will draw up the leaf stalks long and tender. Cut out flower stems as soon as noticed.

Spinach.—Use Viroflay or Long Standing, make a small sowing once in ten days. Use Spinach as a catch crop between Cauliflower, Parsnip rows, or wherever else there is room.

Tomatoes.—Keep them growing vigorously in pots in frames. Give them plenty head and root room.

once with the hoe. The Strawberry is a good feeder, and wood ashes, nitrate of soda, common phosphates or almost any fertilizer will be acceptable. The proper time to apply, however, is before planting, and I would select yard manure if I could have my choice. The earliest berries will be found on the sunny side of dry knolls, or adjoining tight board fences, or timber belts that afford protection. A cold-frame with glass over a portion of the bed will cause those thus covered to ripen before their less favored sisters.

It is not easy to explain why Raspberry and Blackberry plantations deteriorate when the dead canes are not removed, but such is the fact. Possibly the dead wood absorbs too much moisture from the roots. I often renew an old plantation by mowing off both dead and living canes close to the earth while the soil is frozen, hoeing and fertilizing afterward. As the plants attain age they throw up too many canes, thus causing the small berries found on old plantations. We often thin out the bearing canes on old plantations one-half. These fruits, and in fact most fruits, abhor an undrained soil. Wet land is the principal source of failure with the Raspberry and Blackberry. It is the cause of winter killing and feeble growth. Last season many Raspberries turned brown and withered before ripening, lessening the crop one-third. The severe freezing of the previous winter enfeebled the plants. On high, dry lands less loss of this character was observed.

Patrick Barry used to say that the quality of a Black Raspberry was hardly worth considering, but I think he would not say so now, for the varieties differ greatly in quality. Mammoth Cluster is among the best, and Gregg is most deficient in quality. Red Raspberries differ in quality as much as apples. There are few who enjoy the better varieties, as they are not hardy, but they can be easily protected. Franconia possesses many of the good qualities of the better class of red, and Brinckles' Orange of the yellow. In Blackberries the old Lawton and Kittatinny have not been excelled in size and quality, but it must be remembered that they are seldom permitted to ripen fully. If eaten as soon as they color they suggest sips of vinegar or lemon juice, but a week later they soften and are sweet as wild honey.

Rochester, N. Y. *Charles A. Green.*

Peat Muck for Trees or Lawns.—The cleanings of ponds, or peat-muck dug out of the swamps, if carted into a heap on dry ground and left there for one or two winters to freeze and pulverize, is then in capital condition to mix with soil for trees and shrubs. Indeed, it is the best thing we can add to the soil for this purpose. It has an excellent effect on nearly every kind of loamy, gravelly or sandy soils. Its free use on clayey lands renders them more open and congenial to tree and other plant roots, and less liable to bake and crack in summer. On gravelly and sandy land it has an ameliorating and fertilizing influence; besides, it enables the land to hold manure better than it did before the muck had been used. Jarvis Field—the base-ball grounds at Harvard College—was leveled, graded and laid down fresh to grass some years ago. The land is very sandy; indeed, so sandy, that, unassisted by clay, loam or muck, a good stand of grass could not be produced and retained on it. As any quantity of muck could be had conveniently, it was freely used, and a good sward secured. The idea is sometimes entertained that about as much muck as manure will be sufficient. But in preparing holes for trees, one-fourth the bulk of the soil of muck will be little enough. On sandy land for grass, a layer three to six inches deep all over, and this well plowed and harrowed into the ground, but still kept near the surface, will be none too much. But muck alone will not retain a vigorous sod; surface-dressings of manure should also be used. Lawns, in making which muck has been freely used, should be well rolled early every spring, else the frost will leave their surface puckered and uneven. *W. F.*

Transplanting the Arbutus.—The trailing Arbutus is so rarely seen in cultivation that there is some color for the prevalent opinion that it is difficult to transplant. If there is a serious disturbance of the root the plant nearly always dies, but I have transplanted it many times with perfect success. The work has always been done in early spring, just after the flowering is over. A trowel or spade is run down well around the plant, so that a good ball of earth comes with it. Sturdy, small, bushy plants are the best. Of course a shady place should be selected for it. I once set a plant among some rocks in a hollow, shaded by trees; another time at the foot of a small hillock facing north, in both of which situations it flourished and flowered. About Philadelphia the east bank of the Wissahickon is a favorite spot for this plant, but the city is spreading over the Wissahickon hills and is closing in upon its hiding place. This means that the Trailing Arbutus, and many another wild beauty, will soon be lost to us. *Joseph Meehan.*

Petalostemon decumbens is one of the good hardy herbaceous plants that bloom in May. Its flowers are borne in dense spikes of rose throughout the summer. It is one of the legumes, and very distinct, rare and beautiful. It is most suitable for the alpine garden. An established plant will cover nearly a square yard; and as it dies back every fall to an unbranched woody rootstock, from which all decumbent flowering stems arise, it remains much of the same size and condition for years, and can never become a nuisance like some other pretty plants, by becoming too obtrusive. It reaches a height of six or eight inches. *T. D. Hatfield.*

The Forest.

The Forest Vegetation of Northern Mexico.—II.

*Populus Fremontii, var. Wislizeni, Watson Cottonwood.**—Though the impression was purposely conveyed in the preceding article that the high plains of North Mexico are destitute of arborescent vegetation, a few unimportant exceptions must be mentioned. Conspicuous among these is this Cottonwood, which rears high its rounded head of abundant bright green foliage, in striking contrast throughout most of the year with the gray and brown tints of the surrounding landscape. This tree is not abundant, because water is not abundant; for it is a sure index of the presence of living water either on the surface of the soil or not far below it. It grows scatteringly along streams or clustered about springs. Its centre of distribution is on the Rio Grande, and it follows this river northward to its upper waters in south Colorado and the tributaries of this river from whatever direction into their narrower mountain cañons. Westward it ranges along the boundary quite to the Pacific, and southward extensively through the valleys of Mexico, and there often carried by man considerably beyond its indigenous limits.

Cheering to the traveler over heated and dusty hills and plains is the sight of its shining leafage with promise of refreshing shade and water. The Mexicans seem to regard this tree with sentiments similar to those cherished by the Orientals for the Palm or the New Englander for the Maple. They plant it by the water, convenient to which they have built their dwellings, and set it along their irrigating ditches. No visitor to Mexico but has noticed and admired that peculiar feature of Mexican cities, the avenue of grand old Poplars, double-lined on each side it may be, kept alive and flourishing, if on high ground, by streams of water conducted along the rows. The Spanish name for the Cottonwood—for any species of Poplar, in fact—is *Alamo*, that for this avenue *Alameda*, a noun having the form of the perfect participle—that is to say, the Poplared place.

Perhaps it is owing to this sentiment as much as to his proverbial inertia, that the Mexican so generally withholds his axe from his *Alamos*. I have never seen the tree systematically pollarded for firewood in Mexico, as is the practice of Americans in southern California. Seldom is it robbed of its branches, unless they are wanted for planting. In this matter, as in so many others, the Mexican shows his lack of enterprise. His scanty supply of fuel is mostly gleaned amongst Scrub Oaks of mountain sides or the paltry shrubbery of mesas, and brought by pack trains of donkeys through ten or twenty weary miles, when much of it might be grown on stumps along the waste borders of the valley stream or in its torrent-swept gravel.

Nevertheless, when necessity compels, the *Alamo*, yielding in many places almost the only procurable timber of much size, serves, as I have seen, for the few purposes besides fuel required by these simple people—for beams of inferior quality to support the earth covering of the poorer dwellings, mere mud hovels, for crotched posts of bough-covered porches and sheds attached to these, for the huge bars and bar posts and the stockade of corrals for cattle,

* See illustration, page 104.

and even in the construction of the wheels, frame and pole (each six or eight inches thick) of the cumbersome carts of the country.

Associated with the Cottonwood, one sometimes meets with a few scattered specimens of *Salix nigra*, the Black Willow, in size and aspect, as well as in species, identical with the common Willow of the United States. Its tough, strong and easily worked wood is used by the Mexicans for making saddle-trees.

Salix irrorata, a Willow which, among the mountains of Colorado, grows but six or eight feet high, sometimes in Chihuahua follows the streams from mountain cañons down to the plains, and makes in alluvial soil a small tree.

Salix taxifolia, here, as in Southern Arizona, at home along the gravelly alluviums of streams, makes a small tree with a single straight trunk.

Fraxinus pistaciæfolia, the Mexican Ash, often comes out of the mountains in the same way, and in fertile, well-watered valleys makes a large and beautiful tree, two to three feet in diameter and fifty or sixty feet in height. Therefore it is often planted along with the Cottonwood in towns and about the *haciendas* of the rich. The quality of its timber, however, is far inferior to that of the northern White Ash.

Sambucus Mexicana, the Mexican Elder, sparsely scattered through bottom-lands, attains a diameter of nearly a foot and a height of fifteen to twenty. With its rotund head of dense, deep-green foliage, its white flowers and its edible fruit, it often gains a place about Mexican houses.

Juglans rupestris, the Black Walnut of the Southwest, frequently leaves mountain cañons, even following down *arroyos* dry throughout most of the year. Its average diameter in such situations is twelve to eighteen inches and height twenty to thirty feet. With its low, wide-spreading branches, covered with smooth, light-gray bark, it resembles, when not in leaf, the fig-tree. Its nuts, less than an inch in diameter, when freed from their rind, are too meagre to be much prized even in a country where there are no nut-bearing trees except Oaks and Pines.

Celtis occidentalis, var. reticulata, the Hackberry in similar situations, a small tree about a foot in diameter at best, is the only remaining arborescent species of the high northern plains worthy of mention.

C. G. Pringle

Notes on the Norway Pine.

THIS pine is at home in Minnesota. The young trees have the sturdy appearance of the Scotch and Austrian pines, and would they not with equal care prove more beautiful? Cold does not warp the leaves, while the White Pine and the White Cedar have a pinched and frozen appearance with a temperature of 40° F.

The groves of mature trees of Norway Pine form a green roof supported by bronze pillars; light, open, and breezy; in marked contrast with the dark and brushy White Pine woods. The Norway cannot rival the queenliness of the mature White Pine, however. Norway pine is the hardiest and most productive timber produced on the sandy and gravelly ridges and knolls of northern Minnesota. Three measurements of Red Pines are as follows:

	Age.	Diameter in inches three feet from the ground.	Feet of lumber, board measure.
*No. 1	36 years	12	
	101 "	19	360
†No. 2.....	36 "	13½	
	101 "	23	640
‡No. 3.....	19 "	9	
	140 "	20	580

* Injured by fire during fifteenth year.
† Near foot of hill, fifty feet from other Norway trees.
‡ Average tree.

"Jack Pine" (*Pinus Banksiana*) is the natural nurse of Norway pine timber in this region. *H. B. Ayres.*

Correspondence.

To the Editor of Garden and Forest:

I am glad to see that an experienced and learned planter like Mr. Dana condemns in such unmistakable language the Norway Spruce. No tree (for no other foreign tree has ever been so generally planted) has ever so injured the appearance of our plantations. But it is surprising that Mr. Dana, with all his observation and experience, should find any praise for the Austrian Pine. This is certainly one of the poorest trees ever introduced into this country. It is only necessary to see the specimens which were planted in the Central Park, in this city, twenty-five or thirty years ago, to be convinced of this. They vie with the Norway Spruces and Scotch Pines in their shabby and disreputable appearance. These three are the most unsatisfactory trees which have ever been planted in America. The fact that they are very hardy, and grow very fast during a few years, only makes their subsequent want of vigor the more disappointing. The Austrian Pine pushes out vigorously when it is young, but even in its best days it appears lumpy and heavy. As it gets older it grows thinner and thinner, borers attack the trunk, and branches die and fall off. Even in the mountains of southern Austria, where the species flourishes, it is never a large or picturesque tree, and no wise man will ever plant it with the expectation of its lasting more than a few years. Our native Red or Norway Pine is the best substitute for either the Scotch or the Austrian Pine; just as our native White Spruce is the best substitute for the Norway Spruce. The Red Pine is a graceful tree of agreeable color and rapid growth; it is very hardy and will flourish on poor soil.

Why does not Mr. Dana mention the Douglas Fir, which now promises to become one of the most valuable of all our ornamental Conifers? It has proved itself to be an exceedingly valuable and attractive tree in England, where there are specimens more than one hundred feet high. It has been cultivated in this part of the United States for a quarter of a century, or since its discovery in Colorado, and there is not one of the new Conifers which now promises so much.

Among the foreign trees which Mr. Dana extols is *Abies brachyphylla*. The color of this plant is a beautiful dark green, and it grows upward with great vigor, but its strength is in the top. The lower branches are weak (and this is true of the nearly related *A. Veitchii*) and become overshadowed by those above. The result will be that plants of this species by the time they are twenty or twenty-five years old will be bare at the bottom as a specimen of *Abies firma*, the most unsightly of Conifers in this climate. But there are other Japanese Conifers of the greatest merit and much promise which I should like to add to Mr. Dana's list. At the head of these I place *Picea Ajanensis*, which in most collections is cultivated under the erroneously applied name of *P. Alcockiana*, another and much less desirable species of northern Japan, closely related to, if not identical with, the Siberian *P. obovata*. *Picea Ajanensis* is perhaps the handsomest Spruce which can be grown in this climate, for, unfortunately, we cannot have in perfection the lovely and graceful Himalayan Spruce, *P. Smithiana*. Another Japanese Conifer of great beauty and promise is *Thuya Japonica*, improperly called in most gardens *Thuyopsis Standishii*. *Pinus parviflora* is a small and graceful White Pine which should find a place in every collection. It is perfectly hardy; and so too is the Corean Pine, *P. Koraiensis*, one of the most desirable and attractive of the five-leaved Pines. It is never a large tree, but is a very beautiful one, and is better in color even than our native White Pine, and much denser in appearance, as it retains the leaves on the branches during three or four seasons instead of for a single year. The other Japanese Pines, *P. Thunbergii* and *P. densiflora*, are very hardy, but they have no ornamental value. There are several other Conifers which should promise well in this climate, such as *Pinus Murrayana* and *P. monticola*, from the mountains of western America; *Pinus Peuche* and *Picea Omorika* from south-eastern Europe; *Abies Davidiana*, from northern China, which will probably turn out to be a second species of *Keetleria*, and several others. I hope Mr. Dana will give your readers his experience with these and other plants in his large and interesting collection. *Strobus.*

New York City, April 8th.

[We are glad of an opportunity to publish the experiences of planters with new trees. They should all be planted here and carefully tested. The introduction of one first rate tree will repay a thousand failures. It must be borne in mind, however, that we really know very little yet about Japanese and many other exotic Conifers, and still

very little about those from Colorado—much less than we did about the Norway Spruce, when it was thought to be the best Conifer that could be planted in America. The time may come when we shall learn that they are all unreliable. It takes a long time to test the adaptability of a tree to a peculiar climate, and such experiments should be carried on in public establishments, where time and the chances of failure are not important elements, or by individuals who are willing to devote their time and money to such experiments for the sake of the experiments themselves. It is to such planters that we owe in this country most of our knowledge of foreign trees. Those persons who cannot afford to make experiments or run risks with their plantations should plant only such trees as have been thoroughly tested and are known to flourish in this country.—Ed.]

To the Editor of Garden and Forest:

Sir.—In the inhospitable climate of New England, the first sight of the fragile flowers of the Hepatica with its delicate hues, opening in some sheltered spot, before the Winter has fairly gone, always brings a thrill of delight.

Bigelow, in his "Florula Bostoniensis," thus gracefully speaks of the Hepatica: "This delicate little plant is one of the earliest visitors in spring, flowering in sunny spots before the snow has left the ground. The flowers appear on hairy scapes before the leaves. Petals oblong obtuse, purple, sometimes white." It is, however, more especially as an indication of the comparative earliness of different springs that I wished to speak of this flower, having recorded its first appearance in the same locality and mostly on the same plants, for the past twenty-six springs.

The following are the dates in the several years:

April 26th, 1863.	March 30th, 1876.
" 24th, 1864.	" 11th, 1877.
" 2d, 1865.	" 10th, 1878.
" 15th, 1866.	April 5th, 1879.
" 7th, 1867.	March 2d, 1880.
" 19th, 1868.	April 3d, 1881.
" 11th, 1869.	March 5th, 1882.
" 10th, 1870.	April 1st, 1883.
March 19th, 1871.	" 13th, 1884.
April 12th, 1872.	" 15th, 1885.
" 8th, 1873.	March 18th, 1886.
May 3d, 1874.	" 21st, 1887.
April 11th, 1875.	" 23d, 1888.

Chestnut Hill, Mass. *D. D. Slade.*

To the Editor of Garden and Forest:

Sir.—Will some reader of Garden and Forest tell me if a Savin would grow under the shade of a Horse-Chestnut whose lowest branches are ten feet from the ground. The grass is poisoned by the drip. Blue Laurel or Periwinkle does well under similar circumstances. If Savin is unsuitable what can be planted? Could Honeysuckle or Jackman Clematis?

Providence, March 29th. *Ivy* ——.

[Undoubtedly the best plant to grow under the dense shade of a Horse-Chestnut tree is the Periwinkle, which thrives in such situations and makes an attractive appearance throughout the year. If this plant is used the space under the tree to be covered should be carefully forked over and enriched with well rotted stable-manure, and if a dressing of fresh soil can be added it will greatly improve the bed. Strong, well rooted plants only should be set twelve to eighteen inches apart. They should be freely watered during the first season, as the roots of the Horse-Chestnut will absorb a great deal of moisture and so make the surface soil dry. Dwarf Junipers or "Savins" would suffer from drought and shade and give little satisfaction in such a situation, and so would Honeysuckle or Clematis. The Rose of Sharon, or Aaron's Beard (*Hypericum calycinum*), a dwarf and very beautiful, almost evergreen shrub from south-eastern Europe, is very generally used in England to clothe the ground under the shade of trees. It is admirably suited for this purpose, but in New England, except, perhaps, in the extreme southern part, it would require a slight protection in winter. We shall be glad to hear of the experience of our readers with this plant, which is not sufficiently known or appreciated in this country.—Ed.]

To the Editor Garden and Forest:

Sir.—It is well known that the old Azalea *Indica alba* is perfectly hardy as far north as New York City, and also that *Azalea amœna* and its relatives are hardy. But who knows that other varieties of the showy Indian Azaleas are not hardy? These plants have always been high priced, and growers have not experimented with them much in the open air. There is here an opportunity for some of the new experiment stations to do a good turn for landscape gardeners by making tests of the hardiness of all these showy plants. I am inclined to think that there are many hard-wood green-house shrubs that can be grown in the open air further north than we now imagine. Trees of *Citrus trifoliata*, which I planted in northern Maryland eight years ago, bore fruit last year, as stated by a correspondent of the *American Farmer*. These trees the first year they were planted went through a cold wave, in which the mercury fell to 18° below zero, without the loss of a twig. The fruit of this Citrus is about the size of a green Walnut with the hull on, with thick skin and is bitter to the taste. It is good, however, for marmalade. The trees, with their golden fruit, are highly ornamental, and when leafless they are still attractive from the bright green color of the bark. This Orange is a valuable plant for hedges on account of its dwarf and dense growth and terrible thorns. When the seed becomes more plentiful it will no doubt take the place of all other hedge plants where it is hardy. Here also is work for experiment stations in raising hybrids of a more or less hardy nature by crossing this hardy Japanese species with the varieties that bear luscious fruit in Florida. It is not impossible that in this way the Orange belt might be moved much north of its present limit.

Miller School, Va. *W. F. Massey.*

[Experiments in testing the hardiness of trees and shrubs are made continuously in this country in both public and private establishments, and one of the duties of Garden and Forest is to record and make known the results of such experiments as soon as they appear conclusive. The trouble with the Indian Azalea as an out-door plant, even very much further south than this latitude, is, that while it may be sufficiently hardy to withstand the cold of ordinary winters, it has not the reserve strength of constitution to enable it to survive the exceptionally cold waves which pass over this country every few years. South of Virginia the Indian Azalea is one of the most beautiful shrubs which can be grown, as March and April visitors to Mr. Drayton's charming gardens near Charleston can testify; and it is surprising that this plant is not more often seen in our Southern cities. North of Virginia the Indian Azalea should only be planted as an experiment, and with the expectation that unusually cold weather will kill it outright, or at least cut it down to the ground. *Citrus trifoliata* is hardy here; at least a plant has grown and flowered freely in a sheltered spot in the Central Park for many years. This little Orange, however, must be grown more extensively before its perfect hardiness at the North is demonstrated.—Ed.]

Flower and Fruit Pictures at the Academy of Design.

THE flower and fruit paintings which may now be seen at the Academy of Design cannot, as a whole, be included among the pictures which give the exhibition its character as the best that has yet been held. They are not very numerous, and a diligent search reveals scarcely half-a-dozen which can be called even tolerably good. The best American painters of flowers are not represented—neither Mr. LaFarge nor Mr. Alden Weir, both of whom paint flowers beautifully in the most poetic way, and neither Miss Greatorex nor Mr. Carlsen, both of whom are singularly successful in treating them from the decorative point of view. Several ambitious attempts at a decorative treatment of showy flowers may be found. But Mrs. Dillon is not up to her usual level in either her "Roses" or her "Chrysanthemums"—both being painted in a soft, cottony fashion. Mr. C. C. Coleman, too, is hardly up to his average in his picture of purple Magnolias in a purple

jar (ugly enough to have been Rosamond's in Miss Edgeworth's famous story), relieved against a purple velvet hanging—his flowers are painted with little tenderness or charm, and his color scheme is sombre and unattractive. And as for Mr. John F. Weir's large picture of Peonies, it quite deserves that an action for libel be brought against it.

Little variety is shown in the choice of subjects. Roses and Chrysanthemums preponderate—the best being Mr. Ramsey's pink and yellow Roses on a pink cloth, and Mr. Binford McCloskey's yellow and white Chrysanthemums against a dark red background. But neither of these pictures is remarkable, and not much can be said in praise of any of the Hollyhocks, Pansies or Geraniums, which include almost all the other flower paintings. The best of them are very prosaic in effect, and if prose in painting is ever to be condemned as such, it must surely be in the case of pictures of flowers—unless, of course, they are intended to have a merely documentary, scientific value, in which case the higher canons of art cannot be applied to them. The very essence of a flower that is worth painting at all is that it has poetic quality of some kind—either of the bold, brilliant and emphatic kind which touches sentiment on its more sensuous side, or of the idyllic, subtile kind which touches it in its tenderest and most delicate fibres. There is music in the blare of trumpets as well as in the tones of a violin; and so there is pictorial poetry in Chrysanthemums and Peonies as well as in the Wild Rose and the Narcissus. And whoever paints either the one or the other without translating and accentuating this sentiment, fails in the essentials of his task, however correctly he may seem to have drawn and colored, however gracefully he may have grouped his flowers. From this point of view there seemed to me only one really good piece of flower painting in this exhibition—Miss Conkey's simple little picture of pink Chinese Primroses in a broken basket has much more true sentiment in it, more truth to the charm of its subject, more tenderness and poetry than any of the others.

The fruit pictures, among which I beg leave to include two or three excellent pictures of Onions, are much better as a rule than the flowers. Mr. W. J. McCloskey has done excellent technical work in his little painting of Tangerine Oranges wrapped in white papers; Mr. Conely's "Pan of Apples" is very good; and Mr. Harry Eaton's "Fruit"—Oranges and black Grapes on a white cloth—is admirable. There is very clever handling in it, and there is also the great desideratum—a touch of true pictorial sentiment.

If it seems to be difficult to paint flowers well, and especially Roses, what must it be to carve them in marble? Yet even this task is not beyond the power of a good artist. The Roses which the lady holds in her hand whom Mr. St. Gaudens has portrayed in a marble low-relief, are absolutely perfect in their truth to the grace, the delicacy and the poetry of the flower.

M. G. van Rensselaer.

Recent Plant Portraits.

Odontoglossum crispum Gouvilleanum, *Revue Horticole*, March 16th.

Prunus Capuli, *Revue Horticole*, March 16th. The plant here figured appears to be *Prunus serotina*, which is sometimes seen in French nurseries under the name of *P. Capuli*, a Mexican and South American tree for which the oldest published name is *P. salicifolia*.

Crassula lactea, *Gardener's Chronicle*, March 10th.

Begonia Lubbersii, *Gardener's Chronicle*, March 10th.

Phalænopsis, John Seden, *Gardener's Chronicle*, March 17th. A hybrid raised in the establishment of the Messrs. Veitch from *P. amabilis* of Blume, crossed with the pollen of *P. Laddemanniana*. The flower is described as "three inches in diamater, ivory white, densely and uniformly spotted all over both sepals and petals with small dots of a beautiful light purple, the lip suffused with light rosy purple."

Caryota sobolifera, *Gardener's Chronicle*, March 17th.

Hyacinthus corymbosus, *Bulletino dela R Societa Toscana di Orticultura*, February. A dwarf purple-flowered Cape species.

Pear; Pierre Tourasse, *Bulletino dela R. Societa Toscana di Orticultura*, February.

Tea Rose; Mademoiselle Francisca Krüger, *Journal des Roses*, March.

Gladiolus Oberpröisident von Seydderretz; *Gartenflora*, March. A semi-double and not very attractive variety.

Begonia Lubbersii, *Revue de l'Horticulture Belge*, March. A showy Brazilian species with pale flowers and beautifully marked foliage.

Odontoglossum Insleayi, var. Leopardinum, *Revue de l'Horticulture Belge*, March.

Vanilla Flower and its Fertilization, *Bulletin, Royal Gardens, Kew;* March.

Urena Tenax, *Bulletin, Royal Gardens, Kew;* March. A valuable fibre plant from Natal.

Retail Flower Markets.

New York, *April 20th.*

Trade is generally good throughout the city. It is brisk in Broadway shops that catch the cream of it, as a rule. The supply of cut flowers is very full, yet really choice flowers are scarce. Only perfectly grown Roses, that have not been injured after having been cut, will satisfy the patrons of florists in first-class localities; but selected hybrids bring 75 cts. The average run of them are sold for 50 cts. Puritan Roses cost 40 cts. Very large La France—and there are some grand specimens brought in from Hudson River localities—are offered for 50 cts. each. There are quantities of indifferently grown ones arriving, which bring $3 a dozen. Catherine Mermets have improved in quality; they sell for $2 and $3 a dozen. Bride Roses are 20 cts. each, and Perles des Jardins, Souvenir d'un Ami, Papa Gontier and Niphetos cost $1 a dozen. There are a limited number of Papa Gontiers arriving, which are very large and handsomely colored, that bring $2 a dozen. Mde. Cusins costs $1.25 a dozen and William Francis Bennetts are $1.50. There is a glut of *Lilium longiflorum*, the best of which are sold for $3 a dozen. These flowers were disposed of for $5 a hundred early in the week, at wholesale. Callas cost 25 cts. each. The average Lilies-of-the-Valley of indifferent quality bring 75 cts. a dozen, and the best bring $1. Tulips, Daffodils, Roman Hyacinths and Poet's Narcissus cost 75 cts. a dozen. Cut spikes of Dutch Hyacinths sell for $1.50 a dozen. Daisies are 25 cts. a dozen, and Meteor Marigold is 50 cts. a dozen. Mignonette is very handsome, and brings from 50 cts. to $1 a dozen. Both white and purple Lilacs are of excellent quality, and are in good demand at $2 a bunch. Violets are opening their eyes, and becoming poor. They bring from 75 cts. to $1.50 a dozen. Orchids are so scarce that the shops show none. Gardenias bring $3 a dozen. Smilax is 40 cts. a string, and *Asparagus tenuissimus* is 50 cts. a yard.

Philadelphia, *April 20th.*

There has been no serious break in the flower market, no glut, since the heavy Easter traffic, owing to the numerous dinners, receptions, weddings and other festal gatherings in society. Good flowers are plentiful, excepting Lilies-of-the-Valley. The price of these, however, remains at $1 per dozen. Tulips are steady at the same quotation. Owing to the great numbers of the single Trumpet Daffodil which are now blooming freely in the open air, the price has dropped to 50 cts. per dozen; Van Sion, the double variety, which can only be obtained in quantity from green-houses, holds to the price of $1 per dozen. Plants in full flower of varieties of *Primula vulgaris* are becoming more plentiful. The strain in cultivation here is now so mixed by cross fertilization, that it is difficult to distinguish the Polyanthus of our youth from the English Primrose, or, rather, we have Polyanthuses with flowers of the English Primrose. They are very showy and beautiful. One of the most effective uses to which they can be put is, when growing in two-and-one-half or three-inch pots, to arrange them as growing plants in plateaus for dinner-table or other decorations. Forget-me-not is used in the same way. Jacqueminot Roses sell at $3 per dozen. American Beauty, Mrs. John Laing, Baroness Rothschild, and its white variety, Merveille de Lyons, sell at from $4 to $5 per dozen. French Marguerites sell at 25 cts. per dozen; Carnations 35 cts.; Astible 50 cts. per dozen sprays. Smilax remains scarce. *Asparagus tenuissimus* is plentiful and very fine. At a recent dinner an effective centre piece was a flat, circular basket, five feet in diameter, filled with Callas, from which yellow Tulips arose.

Boston, *April 20th.*

The cut flower market continues in an unsettled condition, the result principally of over production. The past winter has been unfavorable to heavy cropping, this being especially true regarding Roses, and now the plants seem to be bent on making up for lost time. So flowers are too plenty and prices unusually low. But this condition is not caused by a reduced demand, for it is very evident from the number of buyers, and the enormous quantities of flowers handled, that flowers are not in the least losing their hold on our people. Corsage bouquets of Roses and spring flowers are very generally worn on the street, and have become almost an essential part of a lady's theatre costume. Such varieties as the Poet's Narcissus, Mignonette, Forget-me-not and Violets are extremely popular for this purpose. There seems to be a very general dislike of strong-scented flowers. Dutch Hyacinths, which are now abundant, are almost unsalable, for no other reason, apparently, than their heavy odor. Though offered in almost every color of the rainbow, and dazzlingly brilliant in mixed collections, these good qualities seem to count for nothing. Violets are getting quite small, as they always do on the approach of warm weather, but they are not abundant, and sell readily for 75 cts. per bunch. Roses remain as at last report, with a downward tendency in prices. Carnations, like Violets, are seen reduced in size, and they are abundant and cheap. Lilies of all kinds are offered in large quantities at low figures. They make more show in large decorations than anything else that can be obtained at present for the same price. Bulbous flowers of all kinds are plenty. In general, the prices and quantities of flowers offered are such that, for the present, at least, no one need be without them.